

CLAIMS

1. An image pickup device comprising:
 - an imaging element for imaging a subject; and
 - 5 a drive signal supplying portion for supplying a drive signal to the imaging element so as to drive the imaging element;
 - wherein the imaging element comprises a plurality of pixel units arranged in a matrix form;
 - each of the pixel units comprises:
 - 10 a photoelectric conversion element for converting incident light from the subject photoelectrically into a signal charge;
 - a readout transistor for reading the signal charge converted photoelectrically by the photoelectric conversion element;
 - an accumulated element for accumulating the signal charge read by
 - 15 the readout transistor;
 - a detection transistor for detecting a voltage signal based on the signal charge accumulated in the accumulated element; and
 - a reset transistor for supplying a reset potential to the accumulated element based on the drive signal supplied by the drive signal supplying
 - 20 portion after the voltage signal is detected by the detection transistor so that the signal charge is reset,
 - wherein the readout transistor has a gate terminal to which a gate potential for reading the signal charge is supplied, and the readout transistor reads the signal charge when the gate potential to be supplied to
 - 25 the gate terminal is changed from a first state to a second state,
 - wherein the detection transistor detects the voltage signal after the gate potential to be supplied to the gate terminal of the readout transistor is changed from the second state to the first state, and
 - wherein the reset potential supplied from the reset transistor to the
 - 30 accumulated element has an intermediate potential between the gate

potential in the first state that is supplied to the gate terminal of the readout transistor and a predetermined VDD potential.

2. The image pickup device according to claim 1, wherein a difference
5 between the reset potential and the gate potential in the first state is large enough to prevent a charge that flows from the reset transistor to the accumulated element from flowing into the photoelectric conversion element beyond the gate terminal of the readout transistor when the reset transistor supplies the reset potential to the accumulated element.
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3. The image pickup device according to claim 1, wherein the first state is a low state, and the second state is a high state.
4. The image pickup device according to claim 1, wherein the reset
15 potential is higher than a ground potential and lower than the VDD potential.
5. The image pickup device according to claim 1, wherein the gate potential in the first state is a ground potential.
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6. The image pickup device according to claim 1, wherein the reset transistor supplies the reset potential to the accumulated element in accordance with a predetermined pulse-shaped reset signal.
- 25 7. The image pickup device according to claim 1, wherein the readout transistor reads the signal charge in accordance with a predetermined pulse-shaped transfer signal for supplying the gate potential to the gate terminal.
- 30 8. The image pickup device according to claim 1, wherein the drive

signal supplying portion supplies a signal having the intermediate potential to each of the reset transistors.

9. The image pickup device according to claim 1, wherein the imaging
5 element further comprises a driver that produces a signal having the intermediate potential based on the drive signal supplied by the drive signal supplying portion and supplies the signal having the intermediate potential to each of the reset transistors.

10 10. The image pickup device according to claim 1, wherein the drive signal supplied by the drive signal supplying portion includes a Hi-z signal, and
the imaging element further comprises a bias circuit that produces a signal having the intermediate potential based on the Hi-z signal supplied
15 by the drive signal supplying portion and supplies the signal having the intermediate potential to each of the reset transistors.

11. The image pickup device according to claim 1, further comprising:
an analog-digital converter for converting the voltage signal detected
20 by each of the detection transistors of the imaging element into a digital signal; and
an image processing circuit for outputting a picture signal based on the digital signal converted by the analog-digital converter.